Alcatel-Lucent 1850 TSS-5

TRANSPORT SERVICE SWITCH | RELEASE 5.1

The Alcatel-Lucent 1850 Transport Service Switch (TSS-5) is a compact, modular, Packet-Optical Transport switch serving TDM and packet traffic from T1/E1 to Gigabit Ethernet (GE). More than a traditional multiservice provisioning platform (MSPP), the Alcatel-Lucent 1850 TSS-5 supports pseudowire emulation edge to edge (PWE3) for T1/E1 circuit emulation services (CES) over Ethernet uplinks. This combination of pseudowire support of CES, native Ethernet transport and native TDM transport with Ethernet over SONET/SDH allows service providers to transform their networks with a mix of SONET/SDH and Ethernet appropriate to their service profile. Service providers can gracefully migrate their TDM traffic to Packet-Optical Transport using this compact, cost-effective platform.

Particularly suitable for mobility-backhaul applications and TDM and Ethernet services aggregation in general, the Alcatel-Lucent 1850 TSS-5 is further applicable to any market where TDM and Carrier Ethernet services coexist.

An integral part of the broader Alcatel-Lucent 1850 TSS portfolio, the Alcatel-Lucent 1850 TSS-5 operates in the access/aggregation layer and feeds into higher-capacity Alcatel-Lucent Packet-Optical Transport products, such as the Alcatel-Lucent 1850 TSS-100 and Alcatel-Lucent 1850 TSS-320.

Features

- Flexible aggregation of TDM or Ethernet service over TDM or Ethernet transport
- T1/E1 CES over Ethernet transport through static Multi-Protocol Label Switching (MPLS) PWE3 with BDF-based tunnel protection
- Differential timing for CES using IEEE 1588v2 for reference clock distribution
- Carrier-grade Ethernet with high reliability and Ethernet OAM standards support
- E1/T1, E3/ DS3; Fast Ethernet (FE)/GE; OC-3/12, STM-1/4; channelized OC-3/ STM-1
- Small Form Factor Pluggable (SFP), coarse wavelength division multiplexing (CWDM)-compatible optics for SONET/SDH and GE
- Compact, environmentally hardened for outside-plant deployment

Benefits

- Enables network transformation from TDM to packets:
  - ¬ Transitions gracefully from TDM-based to packet-based transport
  - ¬ Eliminates overlay networks for packet services
- Optimized for key application: mobility backhaul for smooth transition from TDM to packet for 2G, 3G and 4G networks:
  - ¬ Flexibly backhauls through CES/ pseudowire

- ¬ Efficiently grooms and delivers traffic at the mobile telephone switching office (MTSO) through SONET/SDH interfaces
- ¬ Is environmentally hardened for cell-site deployment
- ¬ Delivers cost-effective, Layer 1 and Layer 2 oriented network infrastructure at cell site and MTSO

- Offers additional applications: hybrid TDM and Ethernet services for business and residential services:
  - ¬ Delivers unified platform for both services
  - ¬ Offers fast time-to-market

- Mixes data, voice and multimedia services on one platform
- Seamlessly operates in circuit and packet networks

Technical specifications

Alcatel-Lucent 1850 TSS-5 system

- 5 Gb/s chassis
- Two multiservice interface slots
- Two half-slots for controller and interface modules
- SFP transceivers for all SONET/SDH and GE interfaces
- CWDM optics for all SONET/SDH and GE interfaces

Alcatel-Lucent 1850 TSS-5 service interface modules

Ethernet module

- 20 x 100BASE-TX (10/100) plus 4 x GE (100/1000 optical or 1000 electrical)
- 6 x FE: half-slot module for EoS, 4 x 100BASE-T plus 2 x 100BASE-FX

SONET/SDH transport with Ethernet over SONET/SDH (EoS) modules

- 8-port T1/E1
- 28-port T1 or 21-port E1

Both 8-port and 28/21-port models equipped with:

- 3 x DS3/E3: DS3 Transmultiplexer (TMUX); 1 channelized, 2 unchannelized; with FEAC loopback and alarms
- 1 x GE: 1000 optical or electrical
- 2 x OC-3/12 or STM-1/4

CES modules

- 8-port T1/E1
- 16-port T1/E1
- 1-port OC-3/STM-1, channelized to T1/E1

Each CES module equipped with:

- 2 x GE: 100/1000, optical or electrical
- Loop and differential timing
- IEEE 1588v2 for clock distribution

Ethernet functionality

- IEEE 802.3 Ethernet interfaces 10/100/1000 Mb/s
- Media Access Control (MAC) bridging, IEEE 802.1D, including Rapid Spanning Tree Protocol (RSTP) and Multiple Spanning Tree Protocol (MSTP)
- 16,000 MAC table
- Virtual local area network (VLAN) bridging, IEEE 802.1Q
- Provider bridging IEEE 802.1ad, Ethernet line (E-line), Ethernet LAN (E-LAN)
- Link aggregation
- Layer 2 control protocol tunneling aggregation
- Ethernet OAM IEEE 802.3ah link loopback
- Connectivity Fault Management (CFM) IEEE 802.1ag: loopbacks, connectivity check, link trace
- Ethernet Ring Protection G.8032
- Jumbo frames: 9 kb
- Full duplex, flow control, MDIX
- Port mirror: in and/or out
- Layer 2 and Layer 3 Access Control Lists (ACLs) for filtering and rate limiting
- Multiple classification options: port, VID, P-bits, MAC DA/SA, differentiated services code points (DSCP)
- Eight Quality of Service (QoS) classes
- Ingress policing
- Class-based queuing
- Strict priority, weighted round robin (WRR) scheduling and tail-drop
- Egress shaping
- Multilink Point-to-Point Protocol (MLPPP)-Ethernet interworking with static routing
- Port-based statistics

PWE3 functionality

- T1/E1 pseudowires: RFC 4553, structure-agnostic TDM over packet (SAToP)
- Bidirectional forwarding detection (BFD) for 1 + 1 tunnel protection
- Related RFCs: 4553, 4446, 4197, 3985, 3916

SONET/SDH functionality

- Unidirectional path-switched ring (UPSR): VT1.5/STS1/STS-3c, Subnetwork Connection Protection (SNCP, VC-12/3/4)
- EoS: frame mapped generic framing procedure (GFP-F), virtual concatenation (VCAT) including low-order VCAT, link capacity adjustment scheme (LCAS), client signal fail (CSF)
- Line timing, SSM with auto-reconfiguration and DS1/E1 building integrated timing supply (BITS) output; free-run
- Equipment protection
- Standard SONET/SDH performance monitoring, loopbacks
- DS1 in-band loopback
- DS3 FEAC loopback and alarms

Management

- Alcatel-Lucent 1350 Optical Management System (OMS)
- Alcatel-Lucent 1340 Integrated Network Controller (INC)
- Transaction Language 1 (TL1)
- Command-line interface (CLI)
- Simple Network Management Protocol (SNMP) v2, v3
- SONET/SDH data communication channel (DCC)
- IP tunneling for remote software download

Physical specifications

Dimensions and weight

- Height: 125 mm (4.9 in.)
- Width: 441 mm (17.4 in.)
- Depth: 280.6 mm (11.0 in.)
- Weight, fully loaded: 6.8 kg (15.0 lb)
- Standard ANSI or ETSI frames

Power

- -48-V DC or +24-V DC
- Redundant power-supply option
- Current drain: 2.5 A maximum, at -48-V DC
- Maximum heat dissipation: 100 W

Environmental

- Hardened for outside-plant operation
- Operating temperature: -40°C to +65°C
- Humidity: 5% to 95%, non-condensing

Regulatory compliance

- NEBS Level 3 GR-1089-CORE Issue 4, GR-63-CORE Issue 3
- CE Mark: EN 300 386
- IEC 60825-1 and IEC 60825-2, 21 CFR 1040
- UL/CSA 60950-1, CSA C22.2 No.60950-1, EN 60950-1
- EN 55022 Class A: radiated and conducted emissions
- EN 61000-4-2, -3, -4, -5, and -6
- ETSI 300-019 Storage, Class 1.2; Transportation, Class 2.3; Operational, Class 3.2
- FCC Part 15 and Industry Canada ICES-003 Class A
- FCC Part 68
- ANSI T1.315 / ETS EN 300-132-2

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